ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION
AIR PERMITS PROGRAM

Proposed
TECHNICAL ANALYSIS REPORT
For Air Quality Control Construction Permit No. 416CP01
Project X-203

Icicle Seafoods Corp.
Northern Victor Seafood Processing Facility
Fish Oil Project

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List of Abbreviations Used in this Permit

AAC ..... Alaska Administrative Code
ADEC ..... Alaska Department of Environmental Conservation
AS ..... Alaska Statutes
ASTM ..... American Society of Testing and Materials
CEMS ..... Continuous Emission Monitoring System
CET ..... Cumulative Equivalent Total
C.F.R. ..... Code of Federal Regulations
COMS ..... Continuous Opacity Monitoring System
EPA ..... US Environmental Protection Agency
HAPS ..... Hazardous Air Pollutants [hazardous air contaminants as defined in AS 46.14.990(14)]
HHV ..... Higher heating value
ID ..... Source Identification Number
MACT ..... Maximum Achievable Control Technology
NAICS ..... North American Industry Classification System
NESHAPs ..... Federal National Emission Standards for Hazardous Air Pollutants [as defined in 40 CFR 61]
NSPS ..... Federal New Source Performance Standards [as defined in 40 CFR 60]
PS ..... Performance specification
PSD ..... Prevention of Significant Deterioration
RM ..... Reference Method
SIC ..... Standard Industrial Classification

Units

acf ..... actual cubic foot
Btu ..... British Thermal Unit (1 Btu = 1,055 Joules)
dscf ..... dry standard cubic foot
gr ..... grain (1 pound = 7000 grains)
GPH ..... gallons per hour
hp ..... horsepower (bhp is horsepower at shaft) (1kW = 1,341 hp)
kW ..... kilowatts
MM ..... million (1 MM Btu = 10^6 Btu)
PPM ..... parts per million
PPMV ..... parts per million volume
TPH ..... tons per hour
TPY ..... tons per year
Wt% ..... weight percent

Pollutants

CO ..... carbon monoxide
HAPS ..... Hazardous Air Pollutants [as defined in AS 46.14.990(14)]
H_2S ..... hydrogen sulfide
NO_X, NO_2 ..... oxides of nitrogen, nitrogen dioxide respectively
PM-10 ..... particulate matter with aerodynamic diameter less than 10 microns
SO_2 ..... sulfur dioxide
VOC ..... volatile organic compound [as defined in 18 AAC 50.990(103)]

1.0 Introduction

1.1 Project Description

Icicle Seafoods, Inc. submitted a construction permit application for the Northern Victor Facility dated December 1, 2003, and requested that the revisions be incorporated into Operating Permit No. 416TVP01 Revision 1. As requested by Icicle in the application, the proposed permit authorizes the use of diesel/fish oil blends in the GM EMD generators, updates the facility's emission source inventory, and revises certain permit conditions as specified through this report. The Department issues this preliminary decision under the authority of AS 46.14 and 18 AAC 50.[1]

1.2 Stationary Source Description

The equipment at the Northern Victor Facility includes diesel generators, boilers, meal dryers, and a small incinerator as specified in Operating Permit No. 416TVP01. Based on the Department's March 5, 2003 Compliance Evaluation, the source inventory is being updated and corrected according to Table 1.21 below:

ID	Source Name	Source Description	Installation Date	Rating/Size (not enforceable)
1	Diesel Generator	GM EMD 16-645 EG 1950 hp	1972	1500 kW
2	Diesel Generator	GM EMD 16-645 EG 1950 hp	1972	1500 kW
3	Diesel Generator	GM EMD 16-645 EG 1950 hp	1972	1500 kW
4	Diesel Generator	Emergency Generator	1990	150 ~~80~~ kW
5	Steam Boiler	Seattle Boiler 350 bhp	1993	11.7 MMBtu/hr
6	Steam Boiler	Johnston Bros. Mod 300 bhp	1997	10 MMBtu/hr
7	Incinerator	Solid Waste	2000 ~~1990~~	200 lb/hr
8	Fish Meal Exhaust	JESMA Model DDF 14/2400S Co-Jet	1989	1800 CMH
9	Burn Basket	Burns trash, galley waste and pallets	--	Open Burn

Note: Source ID 5 has a nameplate date of 1965 and Source ID 6 has a nameplate date of 1980.

1.3 Facility Description

The Northern Victor Facility is a 300 foot floating seafood processing facility (SIC Code 2092 and 2077) with a crew of 200. It processes and freezes white fish (Pollock and Cod) into fillets. Secondary by products are fish meal and fish oil. The vessel has as stabilized moorage system and can be anchored for six months at one location. The Northern Victor operates in Beaver Inlet in Udagak Bay off Unalaska Island, 12 miles from the community of Dutch Harbor. This vessel is isolated from the public on leased property, and is accessible only by floatplane or by boat.
The vessel operates in Alaska during part of the year (e.g., during fishing season) and moves to Seattle every year for maintenance and repair (e.g., during the off-season).

[1] Alaska's air quality permit program and associated regulations underwent a major revision that became effective October 1, 2004. Applicants who submitted a complete permit application prior to this date have the option of having their applications processed under either the "new" or "old" program. Per Icicle Seafoods's request, the Department is processing the PS 5 application and modeling analysis under the old program/regulations.

1.4 Stationary Source and Modifications Classifications

Northern Victor is classified as an ambient air quality stationary source under 18 AAC 50.300(b). The facility would be classified under 18 ACC 50.300(c) if not for existing owner requested limits under 18 ACC 50.305(a)(4). There will be no increase of emissions with this project; therefore, it will not result in classification of the Northern Victor as prevention of significant deterioration (PSD) major facility under 18 ACC 50.300(c)(1).

1.5 Owner Requested Limits

Northern Victor operates under an owner request limit of 225 tpy of nitrogen oxides to avoid classification as PSD major. To keep below this threshold, the current permit limits the cumulative equivalent total (CET) fuel burned in any twelve month consecutive period to 1,122,000 gallons for Units 1-4 and 521,000 gallons for Units 5 & 6.

The applicant has requested a change to the CET fuel limit, from 1,122,000 gallons to 1,011,980 gallons for Units 1-3 to remain under the current 219.6 tons per year (tpy) of nitrogen oxides (NOx) cap for these units. This request is a result of a voluntary source testing (fish oil and diesel blends) conducted by the facility on April 22 through 25, 2003. The Department determined that the facility must obtain a change to their permit because source test results burning diesel fuel yielded higher NOx emission rates than those used in the permit to establish the fuel limits and NO_X emissions cap.

The burning of 50% fish oil in a diesel fish oil blend has been determined to increase NOx emissions in comparison to pure diesel fuel. The Northern Victor confirmed this during the April 2003 source test of various diesel oil/fish oil blends, including the 50/50 blend ratio.

The Northern Victor facility has requested authorization to burn a diesel oil/fish oil blend in Units 1-3 of no more than 50% fish oil. To account for the increased NOx emissions from fish oil, 1 gallon of fish oil/diesel blend will count as 1.123 gallons of diesel equivalent.

2.0 Department Findings

1. The Icicle Seafoods Northern Victor Seafood Processing Facility avoids classification as a PSD major facility in 18 AAC 50.300(c)(1), by limiting the emissions to less than 225 tpy of NOx.

2. As set out under 18 AAC 50.300(a)(4), Northern Victor has requested a change to the CET fuel limit, from 1,122,000 gallons to 1,011,980 gallons for Units 1-3 to remain under the current 219.6 tons per year (tpy) of nitrogen oxides (NOx) cap for these units.

3. As set out under 18 AAC 50.300(a)(4), Northern Victor has requested authorization to burn a diesel oil/fish oil blend in Units 1-3 of no more than 50% fish oil. To account for the increased NOx emissions from fish oil, 1 gallon of fish oil/diesel blend will count as 1.123 gallons of diesel equivalent.

4. Based on the Department's March 5, 2003 Compliance Evaluation, Northern Victor requested that the source inventory is being updated and corrected.

5. Northern Victor has requested a prohibition on burning commercial and industrial waste in Unit 7 as set out by 40 CFR 60 Subpart CCCC. Based on EPA rules, dated February 17,

2004, some of Icicle's waste fits the definition of commercial and industrial waste[2]. The Department did not include this prohibition, but proposes that the facility request an exemption from EPA for this subpart.

6. In order to verify the operational capacity of the incinerator (Unit 7), the Department has added the requirement to keep track of the weight of waste burned on monthly basis and to track the operational hours.

7. The incinerator (Unit 7) is rated at less than 200 pounds per hour. Therefore, as set out by 18 AAC 50.050, there is no particulate matter limit. The Department has revised Condition 56 of Operating Permit No. 416TVP01 Revision 1 to remove Source ID 7 from the requirement for particular matter testing.

8. Northern Victor has requested that the Department remove Condition 13 of Operating Permit No. 416TVP01 Revision 1 as it opts to use Condition 14.

9. Northern Victor has requested that the Department remove Conditions 6 through 11 of Operating Permit No. 416TVP01 Revision 1 as the boiler Units 5 and 6 are not subject to 40 CFR 60 Subpart Dc due to the date of construction.

10. The stationary source's emissions do not increase with this proposed project.

11. The stationary source's fuel burning equipment is subject to the State Air Quality Control Regulations 18 AAC 50.055(a)(1) for visible emissions, 18 AAC 50.055(b)(1) for particulate matter, and 18 AAC 50.055(c) for sulfur compound emissions as specified in Operating Permit No. 416TVP01 Revision 1.

12. The stationary source is located in a coastal zone district. The project modification would be subject to review under the Alaska Coastal Management Program (ACMP) if coastal impacts increase. Permitted activities are consistent with ACMP when permitted through 18 AAC 50, as provided for in AS 46.40.040(b).

13. The application and supplements satisfy the requirements set out in 18 AAC 50.310. Thus, the Department is proposing to approve the request and issue Construction Permit No. 416TVP01 Revision 2.

3.0 Emission Standards

For each facility or modification subject to construction permitting, the applicant must show that the proposed sources comply with state and federal emission standards. The department has adopted federal New Source Performance Standards (NSPS) and National Emission Standards for Hazardous Air Pollutants (NESHAP), by reference in 18 AAC 50.040. In addition, the department has source-specific emission standards listed in 18 AAC 50.050-090.

[2] Federal Register/vo.69, No. 31/Tuesday. Feb.17, 2004/Proposed Rules: Commercial and industrial waste: means solid waste (as defined in this subpart) combusted for reasons that do not include the recovery of heat for a useful purpose, or combusted without heat recovery or with only waste heat recovery. Commercial and industrial solid waste incineration (CISWI) unit measns any combustion unit that combust commercial and industrial waste (as defined in this subpart) that is a distinct operating unit of a any comercial and industrial faclility.

3.1 New Source Performance Standards (NSPS)

The applicant does not propose any new or modified sources subject to Federal NSPS under 40 CFR 60.[3]

3.2 National Emission Standards For Hazardous Air Pollutants

The applicant does not propose any new or modified sources subject to Federal NESHAPs.[4]

3.3 Alaska Emission Standards

Industrial processes and fuel-burning equipment at the facility are subject to specific visible emission, particulate matter, and sulfur compound emission standards as listed in 18 AAC 50.055. Activities are subject to open burning prohibitions as listed in 18 AAC 50.065, and bulk material activities are subject to fugitive dust prohibitions listed in 18 AAC 50.045(d). The monitoring, recordkeeping, and reporting requirements are contained within Operating Permit No. 416TVP01 Revision 1.

3.3.1 Visible Emissions

All industrial processes and fuel burning equipment at this stationary source are subject to a 20 percent visible emission standard as listed in 18 AAC 50.055(a)(1). Operating Permit No. 416TVP01 Revision 1, incorporates this standard for all industrial processes and fuel burning equipment that existed prior to this construction permit. As this construction permit does not authorize any additional industrial processes or fuel burning equipment, the visible emission standard is not included.

3.3.2 Particulate Matter

All industrial processes and fuel burning equipment at the facility is subject to a particulate matter standard of 0.05 grains per dry standard cubic foot of exhaust gas (gr./dscf), as listed in 18 AAC 50.055(b)(1). Permit No 416TVP01 Revision 1 incorporates this standard for all industrial processes and fuel burning equipment. This construction permit does not authorize any additional industrial processes or fuel burning equipment.

3.3.3 Sulfur Compounds

All fuel-burning equipment is subject to the sulfur compound emission standard as set out in 18 AAC 50.055(c). Sulfur compound emissions from fuel-burning equipment, expressed as SO_2, may not exceed 500 ppm averaged over a period of three hours. Fuel oil having sulfur content of 0.74 percent sulfur by weight or less comply with the state compound emission standard, conservatively assuming the minimum theoretical amount of air required for complete combustion. Icicle application has requested no change in the sulfur content of the diesel used in the fish oil blend. Permit No 416TVP01 Revision 1 incorporates this standard for all industrial processes and fuel burning equipment. This construction permit does not authorize any additional industrial processes or fuel burning equipment.

[3] The EPA promulgates and implements New Source Performance Standards (NSPS). The intent of NSPS is to provide technology-based emission control standards. EPA may delegate to each state the authority to implement and enforce standards of performance for new stationary sources located in that state. The department has incorporated by reference the NSPS effective July 1, 1997, for specific industrial activities, as listed in 18 AAC 50.040. However, EPA has not delegated to the department the authority to administer the NSPS program at this time.

[4] EPA promulgates National Emission Standards for Hazardous Air Pollutants (NESHAPs). 18 AAC 50.040 adopts the federal hazardous air pollutant regulations, 40 C.F.R. 61 and 40 C.F.R. 63, by reference. EPA may delegate to each state the authority to implement and enforce certain standards for sources located in that state. At this time, EPA has not delegated authority to the department to administer the NESHAPs program.

3.3.4 General Air Pollution Prohibited

18 AAC 50.110 and preliminary permit Section 8, "*Generally Applicable Requirements,*" of Operating Permit No. 416TVP01 Revision 1 state that no person may permit any emission that is injurious to human health or welfare, animal or plant life, or property, or that would unreasonably interfere with the enjoyment of life and property. Under Section 8 of Operating Permit No. 416TVP01 Revision 1, the Permittee is required to initiate corrective action to eliminate any air pollution violation identified.

4.0 Ambient Air Quality Impact Analysis

Icicle Seafood's proposal did not trigger any of the State's mandatory modeling requirements since emissions did not increase. Therefore, Icicle Seafoods did not conduct an ambient impact analysis for this project.

5.0 Permit Administration

This permit action will authorities the project described within this report. The following are the permit conditions and the Departments preliminary decision.

5.1 Permit Conditions

The department incorporated:

Section 1. - Owner, user, facility identification;
Section 2. - Emission information and classification;
Section 3. - Source inventory and identification;
Section 4. - For the project to comply with ambient standards and increments;
Section 5. - To incorporate State emission standards for fuel burning equipment, and industrial processes;
Section 6. - Documentation.

The department's Title V Team has oversight for all reports, surveillance, records, and inspections of permitted facilities. Therefore, all plans, reports except excess emission reports, and notices required under this permit should be submitted to the Title V Team's Fairbanks Office, as provided for in Section 10 "General Recordkeeping, Reporting, and Compliance Certification Requirements," of Operating Permit No. 416TVP01 Revision 1.

5.2 Project Consistency with ACMP

The facility is located in a coastal district, and may affect the coastal resources. The applicant submitted a coastal project questionnaire (CPQ) as part of the construction permit application. The stationary source has previously been found consistent with the ACMP. The proposal is a project modification under ACMP. The Department distributed the CPQ for this project modification to agency review participants. The participants have not requested additional project ACMP review for this project modification under 6 AAC 50.810. The permitted activities have been found consistent with ACMP through AS 46.40.040(b).

5.3 Preliminary Decision

Icicle's application for a construction permit satisfies the requirements in 18 AAC 50.310 for this type of project. Their application demonstrates that the facility will meet the applicable requirements set out in 18 AAC 50.315(e). Therefore, in accordance with 18 AAC 50.315(b), the

department has made a preliminary decision to issue a construction permit for the project. In accordance with 18 AAC 50.315(c), the department published a public notice in the Dutch Harbor Fisherman in two consecutive issues starting December 23, 2004. The notice solicits public comments regarding the preliminary permit decision. Copies of the preliminary decision are available for review at the department's Juneau and Anchorage Air Permits Offices during the public comment period.

The department will make a final decision whether to issue the construction permit after consideration of comments received during the public comment period.

Appendix A: Example Calculations / Demonstration of fuel limits and fuel blend limits for *ICICLE SEAFOODS NORTHERN VICTOR*

References: Operating Permit 416TVP01 Revision 1, Dated December 6, 2002
Source Test Report "Icicle Seafoods Northern Victor" dated April 22-24, 2003.

TV PERMIT: CURRENT NOx CAP = 225 TPY

Source IDs 1 – 4: Fuel limit of 1,122,000 gal (stated in the SOB as 1,121,000 gal for Source IDs 1-3 and 500 gal for Source ID 4)

Source IDs 5 & 6: Fuel limit of 521,000 gal (stated in the TAR as 521, 2000 gal)

BOILER SOURCE IDS 5 & 6:

NOx emissions of Source IDs 5 & 6 - Based on the TV fuel limits and emission factors.
AP-42 NOx emission factor: 20 lb/1000 gallon.
Potential to emit of each boiler is: 20 lbs/1000 gallon = 0.02 lb/gallon = 2.605 TPY NOx
Boilers Total NOx émissions PTE: 5.21 TPY NOx

EMERGENCY GENERATOR SOURCE ID 4:

NOx emissions for Source ID 4 – Based on SOB limit of 500 gallons and emission factors.
AP-42 NOx emission factor: 604 lb/1000 gallon.
Potential to emit: 0.151 TPY NOx
Emergency Total NOx emissions PTE: 0.151 TPY NOx

GENERATOR SOURCE IDS 1 - 3:

Total NOx allowed for the Source IDs 1, 2, and 3:	Total permitted NOx cap:	225.0 TPY
	NOx emission IDs 4, 5, and 6:	5.361 TPY
	NOx emissions for IDs 1, 2, 3	219.639 TPY

Determine the fuel limit for Source IDs 1 – 3 assuming full load and a NOx emissions cap of 219.6 TPY

Fuel consumption for 100% load diesel fuel based on source test:	115.4 gallons/hr
NOx emission rate for 100% load diesel fuel based on Source test:	50 lb/hr or 0.434 lb/gal

0.434 lb/gal x ? gal/yr = 219.6 TPY

Revised fuel limit: 1,011,981 gal/yr

FISH OIL BURNING:

Source IDs 1, 2, 3 burning fish oil at 50/50 blend and 100% Load:
Blend based on volume blending: 50% diesel and 50% fish oil is 50%/ 50% blend (volume).

Source test results 50/50 blend and 100% load of the engine:

Blended fuel consumption per engine 100% load:	146.4 gallons/hr
NOx emission rate 100% load blended fuel based on source test:	56.4 lb/hr or 0.385 lb/gal
Operating three generators 100% total fuel consumption per hour:	3 x 146.4 = 439.2 gallons/hr
NOx emission rate for 3 generators at 100% load:	3 x 56.4 = 169.2 lb/hr

Determine the blended fuel consumed for Source IDs 1 – 3 assuming full load and a NOx emissions cap of 219.6 TPY

NOx emission rate for 100% load diesel fuel based on Source test: 56.4 lb/hr or 0.385 lb/gal

0.385 lb/gal x ? Gal/yr = 219.6 TPY
Blended Fuel = 1,140,779 gallons

Based on 50/50 blend: 1,140,779/2 = 570,389 gallons of diesel fuel and 570,389 gallons of fish oil

Determination of ratio using 50/50 fuel blends to diesel fuel:

In order to obtain 219.6 TPY NOx with blended fuel 50/50, we need a blend with 570,389 gallons fish oil and 570,389 gallons of diesel fuel.

In order to obtain 219.6 TPY NOx with diesel fuel 100, we need 1,011,981 gallons diesel oil.

Ratio to the diesel and to the blend: 1,140,779/1,011,981 = 1.123

For 1 gallon of fish oil/diesel blend, it will count at 1.123 gallons of diesel